

TROPOSODON, A NEW GENUS OF FOSSIL MACROPODINAE
(MARSUPIALIA)

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ABSTRACT

A new genus, *Troposodon*, is proposed for *Sthenurus minor* Owen, 1877, and *Halmaturus vinceus* De Vis, 1895, is placed in synonymy with *T. minor*. The stratigraphic position of the holotype of *T. minor* is in doubt, but referred material from the Darling Downs in the collections of the Queensland Museum has been derived from both the Pleistocene fluviatile deposits and the Chinchilla Sand of ?Pliocene age.

The taxonomy of many of the fossil macropodids has, as indicated by Ride (1964), been confused by the uncertainty of generic limits, poorly studied subjective synonymy and species limits, and generally unknown temporal relations between named species. This is particularly true of many of the fossil marsupials from the Darling Downs area of south-eastern Queensland.

Considerable revisionary work has been conducted on several genera in these Pleistocene and probable Pliocene deposits, clarifying their taxonomy and stratigraphic position, but the generic positions of the majority of the fossil macropodids revised and described by De Vis (1895) are still unsatisfactory. Bartholomai (1966) has redescribed many of the type specimens of these, and selected lectotypes for those species for which holotypes were not designated, thereby enabling more detailed taxonomic studies to be undertaken.

In the present case this work has proven, as suggested by Stirton (1963) and Tedford (1966), that *Halmaturus vinceus* De Vis is synonymous with *Sthenurus minor* Owen. However, this species cannot be placed in *Sthenurus* Owen, as redefined by Bartholomai (1966) or Tedford (1966), nor can it be referred to any other described macropodid genus. A new genus, *Troposodon*, is therefore proposed for the species.

Specimens referable to *T. minor* are reasonably common in the Upper Cainozoic deposits of Queensland, and sufficient material is present in the collections of the Queensland Museum to evaluate size and morphological variation. No specific differences are considered to exist between the sample from the Pleistocene fluviatile deposits and that from the Chinchilla Sand.

The author expresses his appreciation to Dr. R. W. George, of the Western Australian Museum, for the loan of recent macropodid specimens for comparison, and to Miss Jocelyn A. Tommerup, Biometrician, Queensland Department of Primary Industries, for discussion on the statistics involved in the present study.

All figures throughout are natural size and all measurements are in millimetres. A copy of the data treated statistically in this publication has been lodged in the library of the Queensland Museum.

Family MACROPODIDAE
Subfamily MACROPODINAE
Genus **Troposodon** nov.

TYPE SPECIES: *Sthenurus minor* Owen, 1877.

DIAGNOSIS: The characters of this genus are those of the type species until any other species is described.

DISCUSSION: Owen (1877) originally referred *Troposodon minor* to the genus *Sthenurus* Owen. However, as Stirton (1963) has indicated, the discussion was confusing because Owen thought that *Sthenurus* and the genus *Protemnodon* Owen were closely related. In addition, he mistook the upper teeth in *Protemnodon* for those of *Sthenurus* and consequently referred maxillary specimens of *Sthenurus* to *Protemnodon*. In fact, reference of the species to *Protemnodon* rather than *Sthenurus* would have been more appropriate.

Lydekker (1887) transferred the species to the genus *Macropus* Shaw, employing the combination *M. minor* (Owen). While he realised this name was preoccupied by *M. minor* Shaw, 1800, he did not reject and replace it. Owen's species, however, does not belong with *Macropus*.

As in the genus *Sthenurus*, the molar teeth in *Troposodon* are ornamented by low folds and tubercles of enamel. But, apart from this feature, and their general macropodine bilophodont condition, the molars in *Sthenurus* are dissimilar structurally. In particular, the lophids and lophs are more rectilinear in that genus, while in the lower molars the talonid basin is centrally elevated. In the uppers, the median valley is centrally and labially elevated. The structure of P₂ and P₃ in *Sthenurus* is also markedly unlike that in *Troposodon*, in possessing lingual and postero-labial crests.

Among the recent macropodines, somewhat similar premolar structure to that in *Troposodon* is seen within the genus *Lagostrophus* Thomas. The small Banded Hare-Wallaby, *L. fasciatus*, possesses lower deciduous and permanent premolars which are only slightly less L-shaped than in *T. minor*. However, the lower molars, while occasionally ornamented anterior to the protolophid by folds of enamel, differ considerably in the structure of the forelink. This generally turns abruptly lingually before reaching the anterior cingulum, and unites with a rather strong ridge from the metaconid in the trigonid basin. The upper premolars are similar to those in *T. minor*, but while

the upper molars possess a fold of enamel below the crest of the metaloph, they are otherwise dissimilar. In particular, there is a strong anterior ridge from the paracone to the anterior cingulum, and strong ridges descend posteriorly and anteriorly from the paracone and metacone respectively, across the labial extremity of the median valley. The palate in *L. fasciatus* is markedly incomplete posteriorly. Raven and Gregory (1946) attribute the peculiarities in *L. fasciatus* to a reversal to life in the thickets.

Troposodon minor (Owen, 1877)

(Figures 1-4)

Sthenurus minor Owen, 1877. pp. 352-361, pl. 37, figs. 1-3, pl. 38, figs. 1-4.

Macropus minor (Owen); Lydekker, 1887, pp. 218-219.

[non] *Macropus minor* Shaw, 1800. p. 513, pl. 116.

Halmaturus vinceus De Vis, 1895. pp. 100-102, pl. 16, figs. 12-15.

Halmaturus minor (Owen); De Vis, 1895, p. 118, pl. 18, figs. 1-2.

Macropus minor (Owen); Simpson, 1930, p. 72.

Macropus vinceus (De Vis); Simpson, 1930, p. 73.

"*Halmaturus*" *vinceus* De Vis; Bartholomai, 1966. pp. 120-121, pl. 17, figs. 4-6.

MATERIAL: F3394, cast of holotype of *Sthenurus minor* Owen, B.M.(N.H.) No. 48409, partial palate with left P³ - M³, M⁴ erupting, right P² - M³, M⁴ erupting, P³ exposed by fenestration, juvenile (figd. Owen, 1877, pl. 37, figs. 1-3, pl. 38, figs. 1-4, Talbragar country, Co. Bligh, N.S.W., age Upper Cainozoic (?Pleistocene).

F3577, lectotype of "*Halmaturus*" *vinceus* De Vis (figd. Bartholomai, 1966, pl. 17, figs. 4-6).

One juvenile palate, 5 juvenile maxillae, 4 adult maxillae, 24 juvenile mandibular rami, 24 adult mandibular rami and 5 isolated teeth from the following localities in the eastern Darling Downs: King Creek, Clifton; King Creek, bridge on Pratten road at M.R. 873335 Clifton 1 ml. map; King Creek, between Nobby and Pilton near M.R. 039454 Clifton 1 ml. map; King Creek; Gowrie; ? Gowrie; Condamine River, Macalister, 2 mls downstream from "Armour"; Condamine River, near "Armour" homestead, Macalister; Dalby; Ravensthorpe, Pilton; "Sharrow" (Harrow, Cambooya); Pirrinuan, Jimbour Creek, near Dalby; and from the eastern Darling Downs (particular localities unspecified). An adult palate, 5 adult maxillae, 11 juvenile mandibular rami, 19 adult mandibular rami and 2 isolated teeth derived from the following localities in the western Darling Downs: Condamine River, 50 yards east of Chinchilla Rifle Range, Rifle Range No. 78, Par. Chinchilla; Condamine River, Chinchilla, at M.R. 363677 Chinchilla 4 ml. map; Condamine River, bend in Por. 150, Par. Chinchilla; Middle Gully System, Chinchilla Rifle Range, Chinchilla; Chinchilla; 70 feet deep in well at Warra; and from the western Darling Downs (particular localities unspecified).

An adult mandibular ramus from Por. 117, Par. Binjour, near Gaydah, S.F.Q.

DIAGNOSIS: Moderately large; palate entire; P^3 subrectangular to subtriangular in basal outline, with well defined lingual and posterolingual basins and cingula. Upper molars and molariform deciduous premolar low crowned, with much reduced forelink; shelf-like areas present, posterior to loph crests, ornamented by subsidiary ridges and tubercles in $M^1 - M^3$, and occasionally in M^4 . Mandible with moderately elongate, deep symphysis, flanged ventrally to below P^3 ; geniohyal pit moderately deep; ramus moderately deeply grooved laterally to below anterior molars. I_1 small, oval in section. P_2 and P_3 with longitudinal crests markedly L-shaped; lower molars with low crowns, well developed anterior and posterior cingula; shelf-like areas present anterior to lophid crests, variably ornamented by subsidiary ridges and tubercles in $M_1 - M_3$, and occasionally in M_4 .

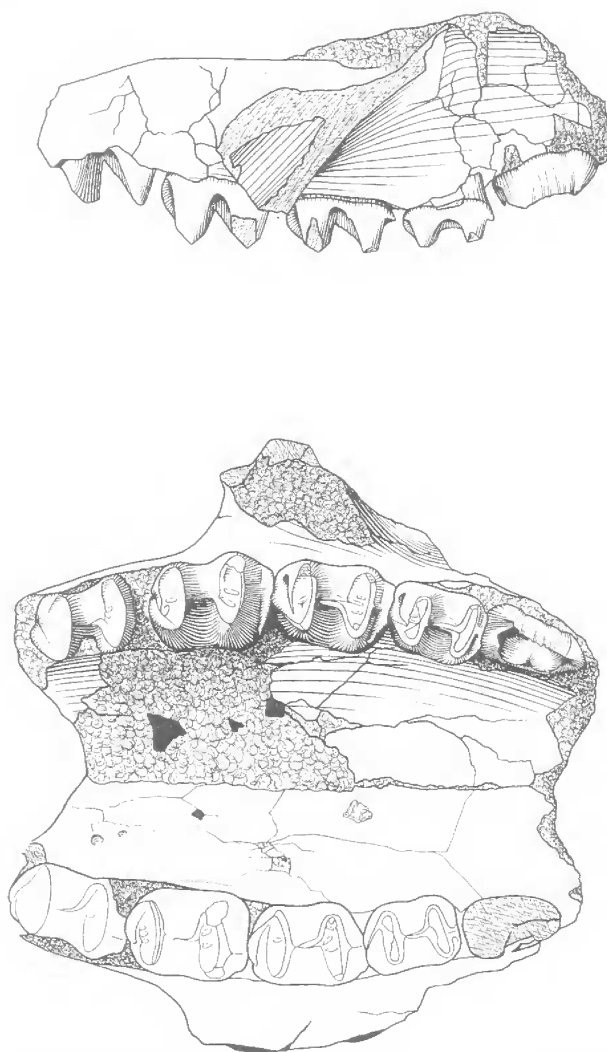


FIG. 1: *Troposodon minor* (Owen). Lateral and occlusal views of incomplete palate; F3576, Gowrie, S.E.Q.

DESCRIPTION: Skull known only from fragmentary maxillary specimens. Palate entire posteriorly, pierced by several, small, post-palatine foramina; infra-orbital canal moderately short, opening 17.0 – 19.0 antero-ventral to orbital rim; zygomatic process relatively short.

I¹⁻³ unknown.

P² known only in extremely worn state; subtriangular in basal outline, broken posteriorly; longitudinal crest low, slightly concave labially; two low, broad, vertical ridges reach crest between paracone and metacone. Lingual cingulum low, worn, uniting with crown base below paracone; lingual basin shallow, broader posteriorly.

DP³ molariform, subrectangular in basal outline, unconstricted across median valley, being variably laterally swollen at lingual extremity of valley; loph low, bowed anteriorly; metaloph broader than protoloph. Anterior cingulum low, broad, short, with only slight indication of presence of forelink labiad to axis of crown. Midlink moderately strong, passing posteriorly to near midpoint of metaloph; slight, ornamented, shelf-like area present posterior to protoloph crest, between paracone and midlink; median valley narrowly U-shaped in labial moiety, broadly so in lingual portion. Ridge from hypocone strong, descending posteriorly to near postero-labial base of crown, flaring posteriorly above axis of crown; ridge from metacone weaker, descending postero-lingually to median part of ridge from hypocone, forming margin to shelf-like area below metaloph crest; area ornamented by low, variable ridges and tubercles. Basally, with slight lingual styler cusp variably developed below protocone.

P³ subtriangular to subrectangular in basal outline, being generally broader posteriorly than anteriorly; longitudinal crest low, slightly concave labially, but varying to almost straight; apex of paracone about one-quarter distance along crown from anterior point; up to five sets of extremely variable, but generally weak vertical labial and lingual ridges transect crest with production of reduced cuspules. Hypocone moderately high, being almost as high as metacone, united to metacone by high, strong, labial ridge. Posterior ridge from metacone curves lingually at base of crown to below hypocone, forming low, moderately narrow, short posterior cingulum; small posterior fossette developed between cingulum and ridge connecting posterior cusps. Anterior ridge from hypocone descends sharply to form moderately low lingual cingulum to below paracone; connected to it by low vertical ridge; lingual cingulum somewhat sinuous in lingual view, being highest opposite centre of longitudinal crest; cingulum and longitudinal crest normally converging anteriorly, but cingulum often variably expanded laterally towards anterior extremity, resulting in near parallel crests. Lingual basin shallow, subtriangular to subrectangular in shape, variably traversed by low, broad ridges. Labial base of crown slightly but variably tumescent; poorly defined styler cusp developed at anterior extremity.

M¹ < M² < M³ < M⁴; molars subrectangular in basal outline, usually very slightly constricted across median valley; loph low, bowed anteriorly; metaloph slightly broader than protoloph in M¹, but generally narrower in M² and M³, and particularly so in M⁴. Anterior cingulum low, broad, ascending labially; forelink reduced, occasionally absent,

positioned labiad to axis of crown when present; labial margin of cingulum variably united to paracone by slight vertical ridge; occasionally, variable, slight accessory links parallel forelink in labial moiety of anterior cingular shelf. Lingual margin of median valley sometimes variably swollen laterally. Moderately strong ridge descends postero-labially from protocone, then turns posteriorly across median valley as generally moderately low midlink to unite with extremely short ridge from near midpoint of protoloph; weaker ridge from paracone descends postero-lingually to midlink limiting shelf-like area below protoloph crest; shelf-like area variably ornamented by subsidiary ridges and tubercles in $M^1 - M^3$, and occasionally so in M^4 . Median valley broadly U-shaped. Strong ridge curves postero-labially from hypocone to near postero-labial base of crown, generally flaring posteriorly above axis of crown; weaker ridge descends postero-lingually from metacone towards ridge from hypocone, limiting shelf-like area below metaloph crest; shelf-like area variably ornamented by subsidiary ridge and tubercles in $M^1 - M^3$, and occasionally so in M^4 . Base of protoloph below protocone usually with variable styler cusp; weak posterior cingulum occasionally present in posterior molars.

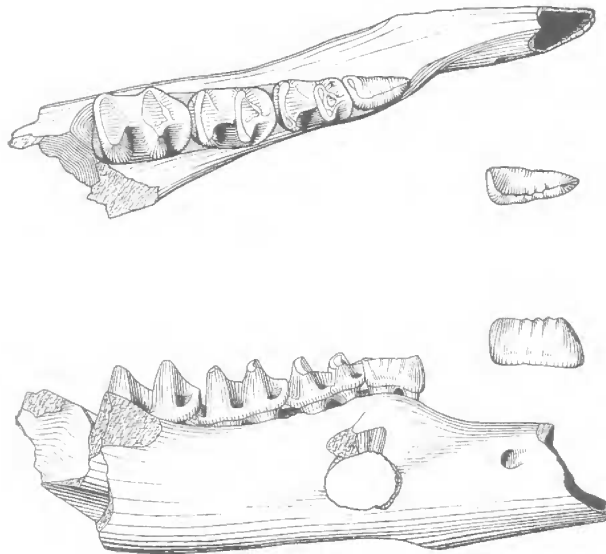


FIG. 2: *Troposodon minor* (Owen). Occlusal and lateral views of juvenile mandibular ramus, with unerupted P_3 exposed by fenestration; F3581, Gowrie, S.E.Q.

Mandible moderately deep, relatively thick; symphysis set at approximately 12° to base of mandible, not ankylosed, comparatively short, deep posteriorly, but relatively shallow anteriorly; flanged postero-ventrally resulting in distinct ventral extension of basal margin below P_3 ; geniohyal pit moderately deep, relatively high, anterior to

posterior symphyseal limit. Diastema comparatively short, with crest acute; ventral margin of ramus sharply rounded between symphysis and diagastric ridge. Mental foramen comparatively small, oval, close to diastemal crest and about half-way between anterior of P_3 and limit of ramus; accessory foramen occasionally developed half-way between $M_2 - M_3$ and ventral margin of ramus. Ramus with deep lateral groove from between mental foramen and diastemal crest to below anterior root of M_2 . Diagastric process very weak, separated from base of angle by very shallow post-diagastric sulcus, bounded above by shallow diagastric fossa; this fossa separated above from shallow depression opening posteriorly into pterygoid fossa. Post-alveolar shelf short, with well defined angle, leading to post-alveolar ridge, ascending posteriorly to disappear on mesial wall of coronoid process above large mandibular foramen. Masseteric crest raised to about level of alveolar margin; masseteric foramen moderately large, with deep masseteric fossa. Angle of mandible, condyle and bulk of coronoid process not preserved.

I_1 imperfectly preserved; small, oval in transverse section, much higher than wide, enamelled both labially and lingually.

P_2 robust, moderately elongate, subtriangular in basal outline. Longitudinal crest abruptly curving postero-lingually, giving crest a marked L-shaped appearance; crest transected by three variable sets of vertical labial and lingual ridges, with production of cuspules at crest. Base of crown usually swollen lingually.

DP_3 molariform, slightly constricted across talonid basin, with lophids moderately low, slightly convex posteriorly. Hypolophid much broader than protolophid. Trigonid basin broad, its length being less than distance between lophids. Forelink moderately high, strong, descending slightly antero-lingually from protoconid to near midpoint of moderately low anterior cingulum; relatively strong ridge descends antero-labially from metaconid to unite with forelink, with production of shelf-like area below protolophid crest; second ridge occasionally present descending from metaconid to lingual extremity of anterior cingulum; shallow fossette formed in labial moiety of trigonid basin. Midlink moderately high, strong, descending from hypoconid across talonid basin to near midpoint of protolophid. Talonid basin labially and lingually broadly U-shaped, but occasionally with low labial fold; slight ridge descends antero-labially from entoconid towards midlink, with production of shelf-like area below hypolophid crest; this ridge occasionally passes into talonid, parallelling midlink. Weak ridge descends posteriorly from entoconid to unite with lingual extremity of short, broad, well defined posterior cingulum.

P_3 elongate, robust, subtriangular in basal outline, with longitudinal crest abruptly curving postero-lingually giving the crest a marked L-shaped appearance; crest normally transected by three moderately coarse sets of vertical labial and lingual ridges, and posteriorly by a set of very weak ridges; cuspules produced along crest. Lingual base of crown variably swollen.

$M_1 < M_2 < M_3 < M_4$; molars subrectangular in basal outline; lophids low with hypolophid broader than protolophid in M_1 , almost equal in M_2 and M_3 , and narrower in M_4 . Trigonid basin relatively broad, moderately long, its length almost equalling distance

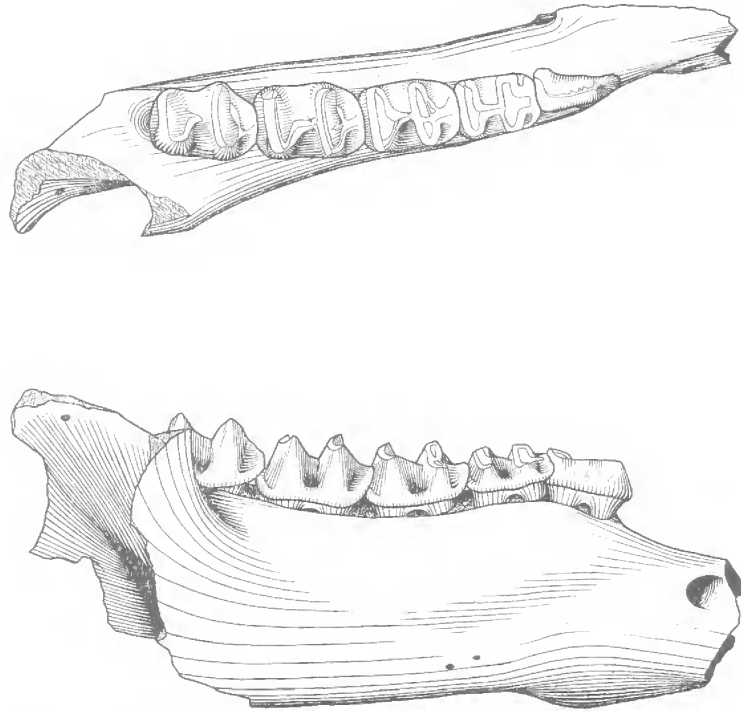


FIG. 3: *Troposodon minor* (Owen). Occlusal and lateral views of adult mandibular ramus; F655, Gowrie, S.E.Q.

between lophids. Forelink relatively high, strong, descending antero-lingually from protoconid then anteriorly to near midpoint of moderately high anterior cingulum; forelink occasionally ornamented by subsidiary ridging; antero-labial fossette formed in trigonid basin. Moderately strong accessory ridge descends antero-labially from metaconid to forelink, with production of shelf-like area ornamented by variable subsidiary ridges and tubercles. Strong ridge descends antero-lingually from hypoconid, then anteriorly above talonid basin as strong, moderately high midlink; this unites with short ridge from near centre of protolophid; talonid basin broadly U-shaped labially and lingually, occasionally with low fold at labial margin. Moderately strong accessory ridge descends antero-labially from entoconid towards midlink, with production of shelf-like area below hypolophid crest; shelf-like area ornamented by variable subsidiary ridges and tubercles in M_1 and M_2 , usually absent in M_3 and M_4 . Slight variable ridge descends posteriorly from entoconid to unite with broad, well defined posterior cingulum.

DISCUSSION: The holotype of *Troposodon minor* was originally forwarded to the British Museum (Natural History) by the Reverend W. B. Clarke in 1877, and was recorded by Owen (1877) and Lydekker (1887) as having been derived from a rocky

alluvial deposit in the shaft of a gold lead in the County of Phillip, New South Wales. Ride and Mahoney (pers. comm.) have indicated that this locality is incorrect, Clarke having initially misinformed Owen regarding the type locality. Clarke (1878, p. 209) has corrected the locality to "Talbragar country", in a footnote relating to information received from a Mr. Lowe. Doubt still exists as to whether the specimen was from Pleistocene alluvial deposits or whether it was derived from possibly older deposits in a gold lead, so that its exact position within the Upper Cainozoic remains problematical.

De Vis (1895) separated much of the Queensland material from *T. minor*, and described a new species, *Halmaturus vinceus*, for these specimens. He failed to designate a holotype, and Bartholomai (1966) selected F3577 as lectotype of "*H.*" *vinceus*. Of the specimens referred by De Vis (1895) to *H. minor*, only the juvenile maxilla containing M^1-M^3 , with P^3 ready to erupt has been recognised. As with the lectotype of "*H.*" *vinceus*, this is morphologically identical with the holotype of *T. minor*. One of the mandibular specimens referred by Lydekker (1887) to *Macropus minor*, B. M. (Nat. Hist.) No. 50063a, from Gowrie, S.E.Q., a cast of which, F3401, is present in the Queensland Museum collections, is identical with other specimens here referred.

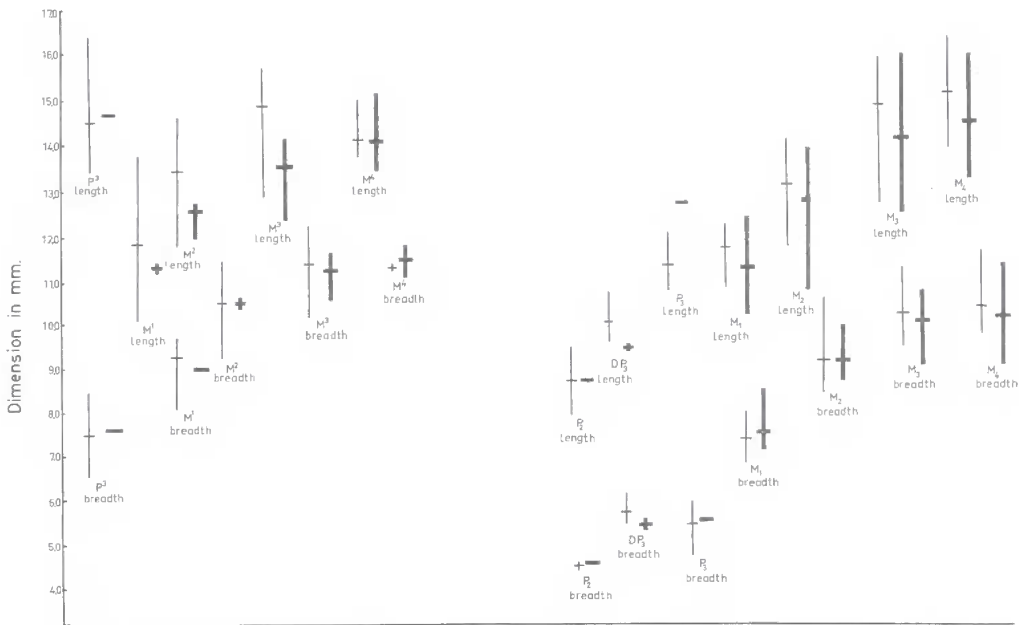


FIG. 4: *Troposodon minor* (Owen). Observed ranges and means for lengths and breadths of cheek teeth for eastern and western Darling Downs samples; vertical lines represent observed ranges, horizontal bars represent position of means, light lines represent eastern Darling Downs sample and heavy lines are for western Darling Downs sample.

TABLE 1
COMPARISON OF MEANS OF SAMPLES OF *Tropodotn minor* (OWEN), FROM THE EASTERN AND WESTERN DARLING DOWNS DEPOSITS

Character	Eastern Darling Downs Sample				Western Darling Downs Sample				Comparison of Means	
	N	\bar{X}	OR	s	N	\bar{X}	OR	s	t	P
P ² length	1	11.60	—	—	—	—	—	—	—	—
width metaloph	—	—	10.7-11.0	—	—	—	—	—	—	—
DP ³ length	3	10.83	7.7-7.8	—	—	—	—	—	—	—
width protoloph	2	7.75	13.3-16.4	—	—	—	—	—	—	—
P ² length	12	14.45	6-6-8.5	0.9501	1	14.70	—	—	0.16	0.5
width metaloph	11	7.51	10.1-13.8	0.6533	1	7.60	—	—	0.12	0.5
M ¹ length	14	11.83	8.0-9.8	0.8905	3	11.33	11.2-11.4	—	0.48	0.5
width protoloph	11	9.27	11.8-14.7	0.5728	1	9.00	—	—	0.45	0.5
M ² length	14	13.44	9.2-11.5	0.9866	4	12.45	11.9-12.7	0.4282	1.91	0.05
width protoloph	14	10.49	12.8-15.9	0.7809	4	10.43	10.4-10.5	0.0503	0.15	0.5
M ³ length	11	14.90	10.2-12.3	0.9899	6	13.52	12.3-14.2	1.6795	3.03	0.01
width protoloph	11	11.36	13.7-15.1	0.7461	6	11.17	10.6-11.6	0.3503	0.58	0.5
M ⁴ length	3	14.23	11.2-11.4	0.7578	6	14.13	13.5-15.3	0.6595	0.36	0.5
width protoloph	2	11.30	7.9-9.6	0.1415	6	11.53	11.1-11.8	0.2875	0.45	0.5
P ₂ length	4	8.73	4.5-4.7	0.7363	1	8.70	—	—	0.04	0.5
width posteriorly	4	4.63	9.6-10.8	0.0872	1	4.70	—	—	0.23	0.5
DP ₃ length	8	10.15	5.5-6.2	0.4472	2	9.50	9.4-9.6	0.1415	0.34	0.5
width protolophid	7	5.76	10.8-12.1	0.2636	2	5.50	5.4-5.6	0.1415	1.09	0.5-0.1
P ₃ length	11	11.35	4.7-6.0	0.3561	1	12.70	—	—	3.63	0.01
width posteriorly	11	5.53	10.8-12.4	0.3839	1	5.60	—	—	0.17	0.5
M ₁ length	23	11.83	6.8-8.1	0.3980	7	11.27	10.3-12.5	0.8750	2.41	0.05-0.01
width protolophid	20	7.44	8.5-10.7	0.3575	6	7.57	7.1-8.6	0.5502	1.22	0.5-0.1
M ₂ length	27	13.22	12.8-16.0	0.5787	16	12.73	10.8-14.0	0.8994	2.18	0.05-0.01
width protolophid	25	9.18	9.5-11.4	0.4707	15	9.20	8.7-10.0	0.4192	0.02	0.5
M ₃ length	30	14.98	14.0-16.5	0.8399	16	14.24	12.6-16.0	0.7806	3.66	0.01
width protolophid	27	10.23	9.8-11.7	0.5208	13	10.09	9.1-10.8	0.4132	0.85	0.5-0.1
M ₄ length	21	15.35	8.8-11.7	0.6852	13	14.57	13.3-16.0	0.7949	3.03	0.01
width protolophid	20	10.48	—	0.5310	11	10.17	9.1-11.4	0.6182	0.27	0.5

With the exception of one mandibular ramus, specimens now referred to *T. minor* in the Queensland Museum collections are from localities within both the Pleistocene fluvialite deposits and the Chinchilla Sand of possible Pliocene age. Species differences generally exist within genera in the eastern and western Darling Downs deposits, as shown by Woods (1958, 1960) and Bartholmai (1962, 1963). However, in the case of *T. minor*, no constant morphological differences could be found to justify separation of the specimens within the two samples. Structurally, the lower molars in specimens from the Chinchilla Sand tend to have a better defined accessory ridge in the trigonid basin from the metaconid to the forelink, but this is by no means constant. Table 1 illustrates some apparent differences in the comparison of means of the samples from

TABLE 2

COEFFICIENTS OF VARIATION FOR COMBINED EASTERN AND WESTERN DARLING DOWNS SAMPLES OF *Troposodon minor* (OWEN)

Character	F. 3394, cast of holotype		N	OR	\bar{X}	s	V
	right	left					
P ² length	—	—	1	—	11.60	—	—
width metaloph	—	—	—	—	—	—	—
DP ³ length	11.0	—	3	10.7-11.0	10.83	0.1530	1.41
width protoloph	—	—	2	7.7- 7.8	7.75	0.0708	0.91
P ³ length	13.8	13.7	13	13.3-16.4	14.55	0.9107	6.26
width metaloph	—	6.6	12	6.6- 8.5	7.60	0.6164	8.11
M ¹ length	11.9	11.9	17	10.1-13.8	11.74	0.8389	7.15
width protoloph	—	8.8	12	8.0- 9.8	9.17	0.5416	5.91
M ² length	13.5	13.8	18	11.8-14.7	13.22	0.9747	7.19
width protoloph	9.2	9.9	18	9.2-11.5	10.48	0.6839	6.53
M ³ length	15.9	15.8	17	12.3-15.9	14.42	1.1418	7.91
width protoloph	10.8	11.1	17	10.2-12.3	11.29	0.6290	5.57
M ⁴ length	—	—	9	13.5-15.3	14.40	0.6892	4.79
width protoloph	—	—	8	11.1-11.8	11.48	0.2713	2.36
P ₂ length	—	—	5	7.9- 9.6	8.72	0.6471	7.42
width posteriorly	—	—	5	4.5- 4.7	4.64	0.0894	1.93
DP ₃ length	—	—	10	9.4-10.8	10.02	0.4826	4.82
width protolophid	—	—	9	5.4- 6.2	5.70	0.8216	2.60
P ₃ length	—	—	12	10.8-12.7	11.47	0.5157	4.50
width posteriorly	—	—	12	4.7- 6.0	5.56	0.3655	6.57
M ₁ length	—	—	30	10.3-12.5	11.70	0.5792	4.95
width protolophid	—	—	26	6.8- 8.6	7.49	0.3934	5.25
M ₂ length	—	—	43	10.8-14.3	12.80	0.8287	6.47
width protolophid	—	—	40	8.5-10.7	9.20	0.4557	4.95
M ₃ length	—	—	46	12.6-16.0	14.16	0.7507	5.30
width protolophid	—	—	40	9.1-11.4	10.18	0.4810	4.72
M ₄ length	—	—	34	13.3-16.5	15.05	0.8479	5.63
width protolophid	—	—	31	9.1-11.7	10.36	0.5964	5.76

the eastern and western Darling Downs deposits by Student's test. These indicate significance in the lengths of M^3 , P_3 , M_3 , and M_4 at the 1% level, and approach significance in the lengths of M_1 and M_2 , at the 5% level. This is graphically illustrated in figure 4. Length of tooth is a character affected by attrition, particularly in adult specimens, and as the proportion of adult specimens is greater in the western Darling Downs sample, it is not believed that separation on this basis, at the specific level, is warranted at this time.

The summaries of measurements in Table 2 for combined samples of maxillary and mandibular teeth indicate only slight to moderate variation, as expressed by the coefficient of variation and are not inconsistent with the values of V suggested by Simpson *et al.* (1960) for dimensions in teeth in a single fossil species from differing stratigraphic levels. Many of the extremely small values for V are related to the small samples analysed. The coefficient of variation for length of tooth is often larger than that for breadth, particularly in those samples with a small number of variants. This again is influenced not only by initial size differences, but also by the reduction of the anterior and posterior cingula by attrition between adjacent teeth.

Two isolated left lower premolars, F4402 and F4436, suggest the presence of material distinct from *T. minor* in the Chinchilla Sand. Only F4402 has specific locality information, namely Warra, S.E.Q. F4436 is unworn and possesses extremely well-defined vertical ridges transecting the longitudinal crest. The teeth are considerably larger than the corresponding teeth in *T. minor*, but the evidence is too meagre to draw any definite conclusions at this time.

As with the majority of the Australian Upper Cainozoic marsupials, mandibular remains of *T. minor* have never been found associated with maxillae. Occlusion is, however, satisfactory and because of the similarity in ornamentation of the upper and lower molars, no doubt exists as to the correctness of their present association. As yet, post-cranial remains of *T. minor* are unknown.

In *T. minor*, the permanent premolars usually enter the tooth row after the emplacement of the third molars and are generally in use during the eruption of M^4 and M_4 . However, F4445 illustrates the condition where M_4 is in place in advance of P_3 . In both the holotype palate and the palate F3576, the left P^3 is erupted before the right permanent upper premolar.

It appears that the tooth structure in *T. minor* indicates a secondary reversal from grazing macropodines to a semi-browsing habit, although it is unlikely that such reversal was in any way as complete as that in *Sthenurus* or *Procoptodon* Owen.

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